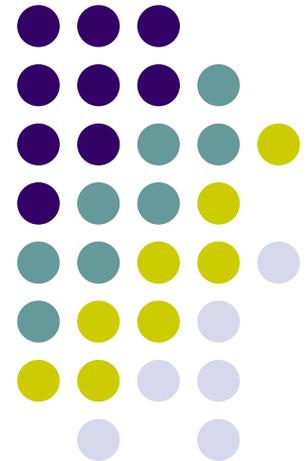


Reactive N monitoring in RMNP and NE Colorado February 2015 status update

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Monitoring Objectives



- NE Colorado
 - Monitor and track changes in ammonia concentration in the Front Range/NE CO
 - Help separate contributions from agriculture and other activities to Front Range/NE CO ammonia
- Rocky Mountain NP
 - Monitor and track changes in total reactive N deposition at RMNP
 - Apportion total deposited N to oxidized (HNO_3 , NO_3^-), reduced (NH_3 , NH_4^+) and organic N compounds
 - Support apportionment of contributions of source regions and source sectors to N deposition

Reactive N monitoring status



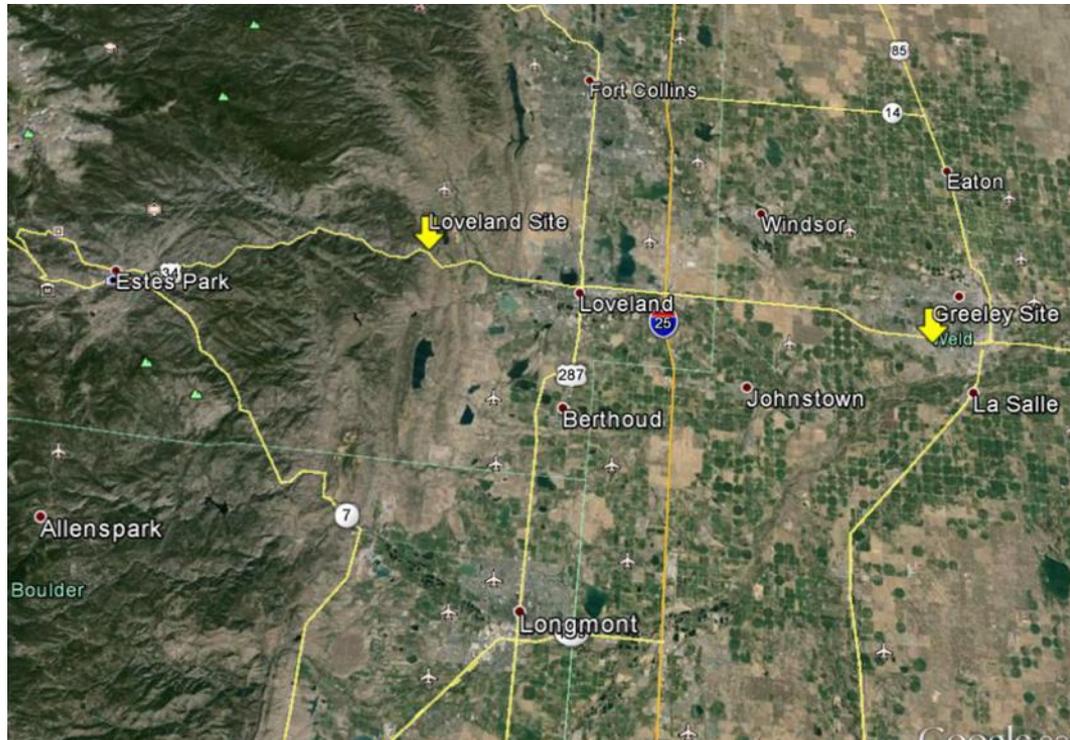
- Ammonia in NE Colorado (mid-March – mid-Oct)
 - NE CO passive NH₃ weekly monitoring network (funded 2014+ by CSU Ag Expt. Station/USDA)
 - High time resolution (~minutes) NH₃ monitor to examine concentration vs. wind direction
 - Continued operation of Greeley site (began 2014)
 - New site west of Loveland
- Oxidized and reduced nitrogen gases, particles, and wet deposition in RMNP (mid-March – mid-Oct)
 - 24 hr samples of gaseous ammonia and nitric acid and fine particle ammonium and nitrate (funded 2014/15 by NPS)
 - ~48 hr wet deposition samples of ammonium, nitrate and organic nitrogen (funded 2014/15 by NPS)
 - Continuous measurement option (EPA proposal pending)

NE CO Monitoring for 2015

March 15 – October 15

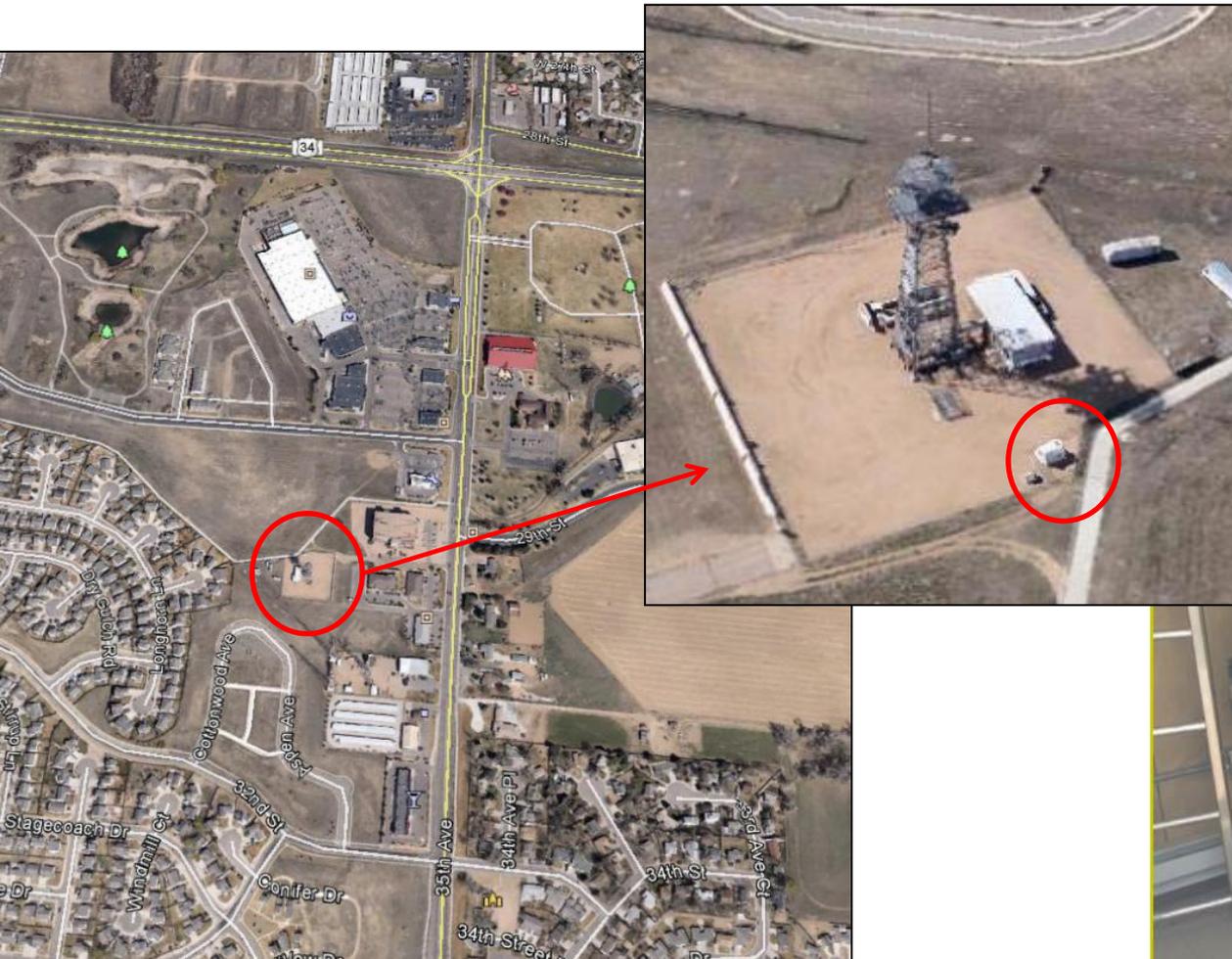


- Resume monitoring at Greeley Site
- Additional monitoring in Loveland, CO
 - Near mouth of Big Thompson Canyon along 34



Greeley Monitoring Site

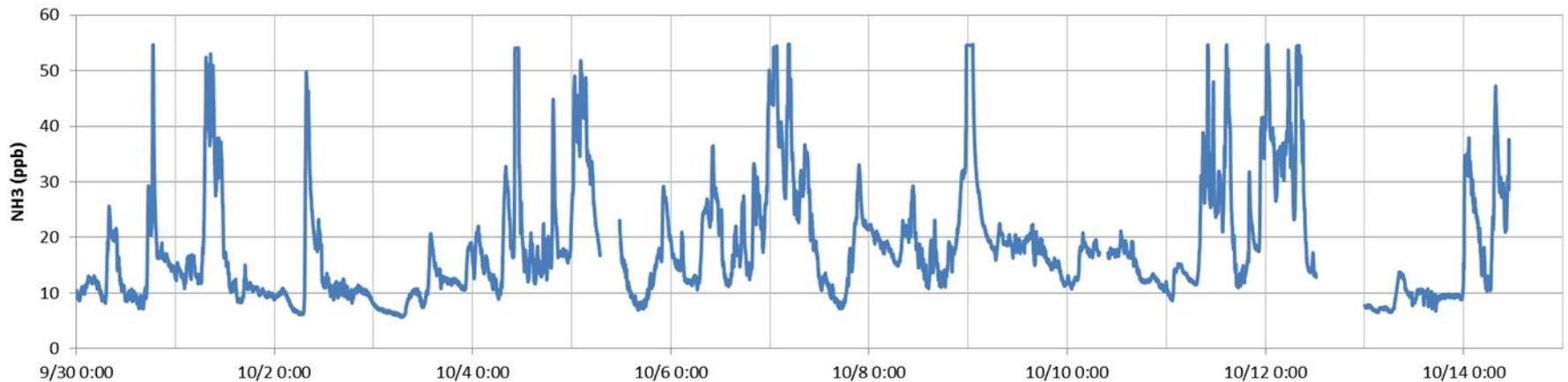
- Highway 34 and 35th Ave



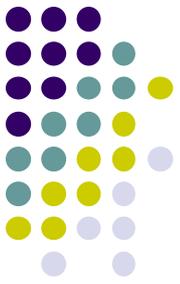
Greeley 2014 ammonia monitoring



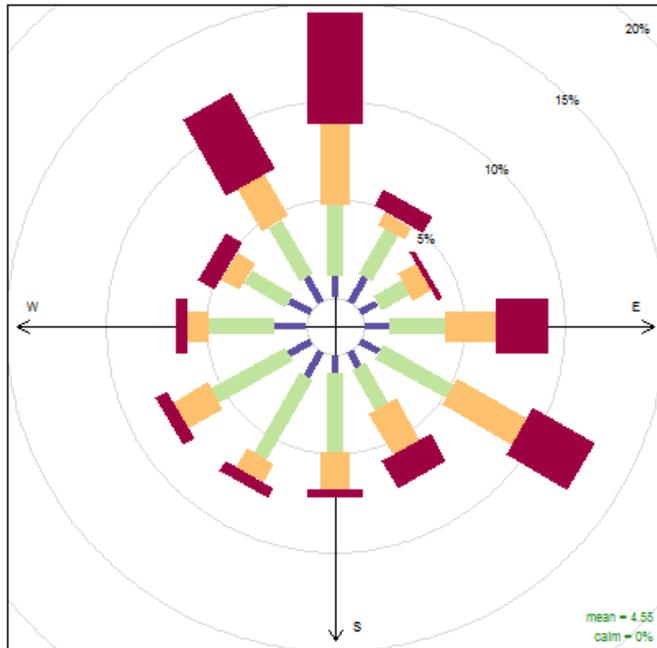
- High time resolution measurements at CDPHE Greeley shelter from end of July through mid-October
- 2015 measurements will run mid-Mar through mid-Oct



Preliminary Analysis

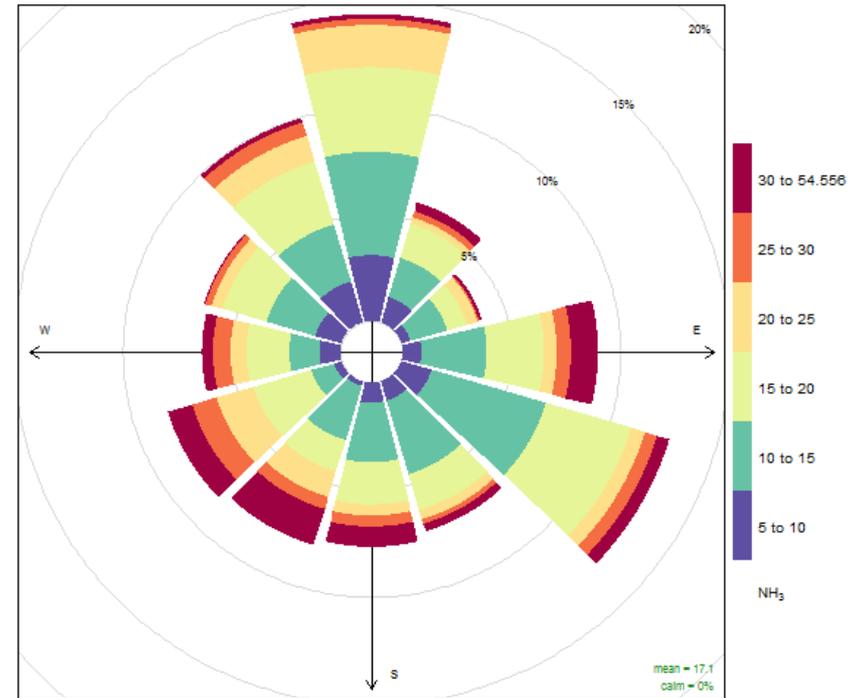


Wind Rose

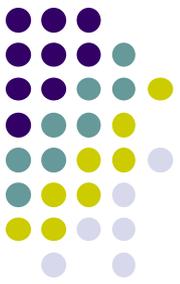


0 to 2 2 to 4 4 to 6 6 to 20.2
(m s⁻¹)
Frequency of counts by wind direction (%)

Pollution Rose

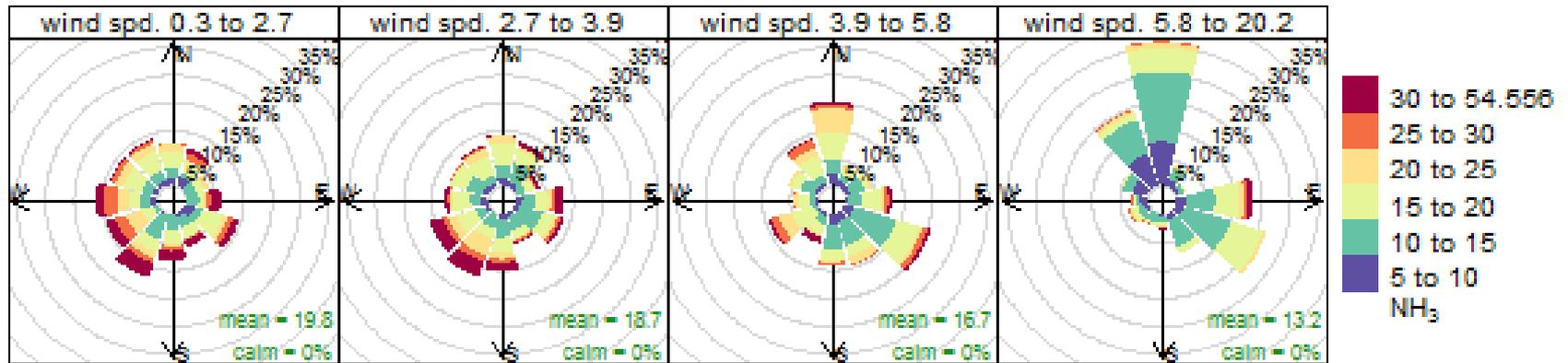


Frequency of counts by wind direction (%)

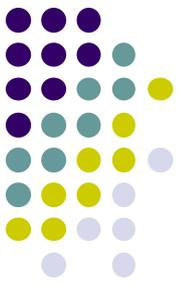


Preliminary Analysis

- Pollution Rose for different wind speeds
 - Highest concentrations when winds speeds are lower.



Frequency of counts by wind direction (%)



Loveland Monitoring Site

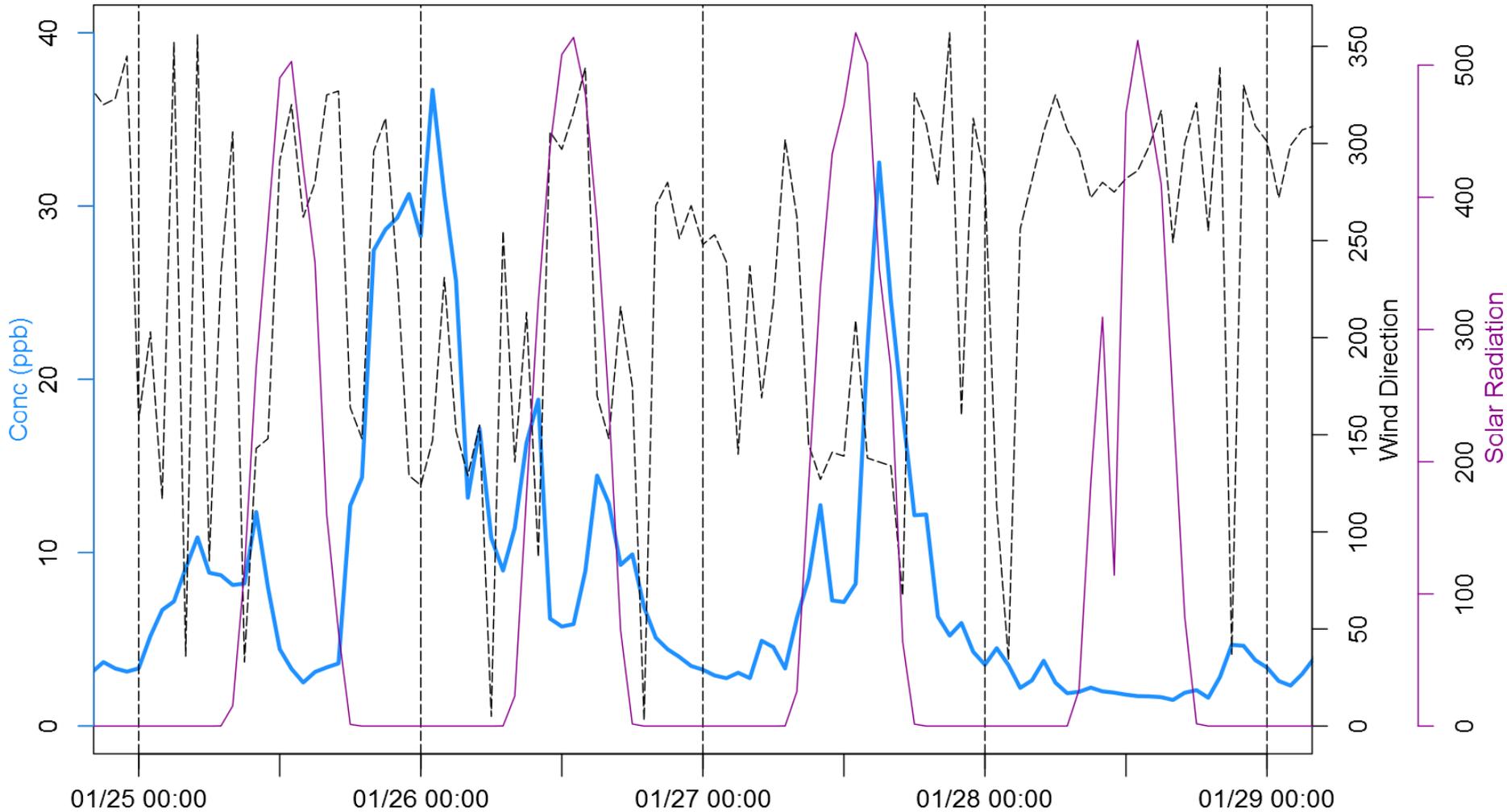
- Essentially behind the Dam Store
- On Bureau of Reclamation Land

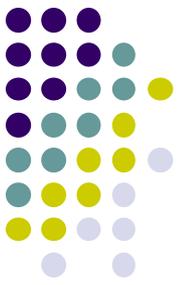




Results from Ft Collins

Continuous Ammonia





NE Colorado funding status

- Greeley equipment (CDPHE) and monitoring (EPA) covered for 2015
- West Loveland equipment (CDPHE) and monitoring (NRCS)
 - Waiting for matching funds from NRCS
- Additional funding needed for NE Colorado monitoring beyond 2015
 - Monitoring budget ~\$60K/yr
 - CDPHE committed \$5K/yr
 - West Greeley Conservation District \$5K/yr
 - NRCS planning support beyond 2015
 - Additional producer funding needed (Match to NRCS)
 - can make (tax deductible) contribution to CSU

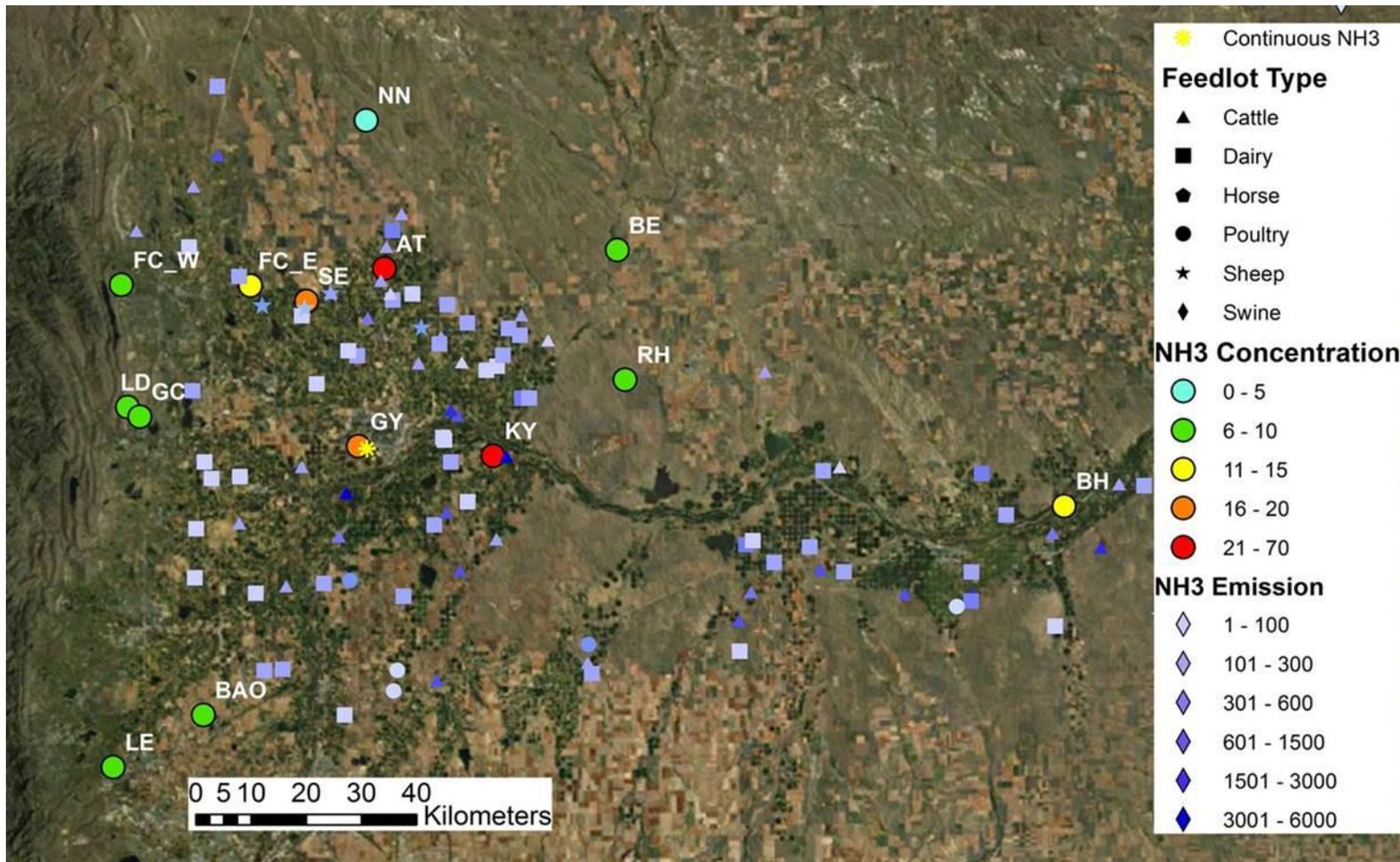
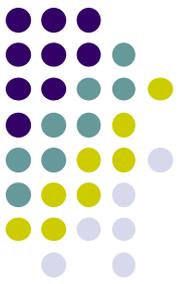
CSU Foundation



- Can make checks directly to the **CSU Foundation** and in the memo put: **#70983 NE CO Ammonia Monitoring.**
- We will need approximately \$20,000/yr to take advantage of full matching NRCS funding (2016&2017).
- Need funds by March of monitoring year but better to have before then. Any funds donated this year will be held over until next year when we need them for the match.
- As of this week we have received \$2,000 from the Colorado Wheat Administrative Committee.

NE Colorado passive ammonia

Summertime average NH_3 concentrations (ppbv)





Lowland Water Storage Rese

34

Canal Access Rd

W Eisenhower Blvd

Rocky

Missouri Rd

W. 1st St



